

What is Claimed is:

1. A powder batch comprising cathodoluminescent phosphor particles, wherein said particles have a weight average particle size of from about 0.1 μm to about 10 μm and have a substantially spherical morphology, wherein at least about 80 weight percent of said particles are not larger than about two times said average particle size.

2. A powder batch as recited in Claim 1, wherein said particles have a weight average particle size of from about 0.3 μm to about 5 μm .

3. A powder batch as recited in Claim 1, wherein said particles have a weight average particle size of from about 0.3 μm to about 3 μm .

4. A powder batch as recited in Claim 1, wherein said particles comprise Y_2O_3 .

5. A powder batch as recited in Claim 4, wherein said particles further comprise Eu.

6. A powder batch as recited in Claim 1, wherein said particles comprise $\text{Y}_2\text{O}_2\text{S}$.

7. A powder batch as recited in Claim 6, wherein said particles further comprise a dopant selected from the group consisting of Eu, Tb and combinations thereof.

8. A powder batch as recited in Claim 1, wherein said particles comprise ZnS .

9. A powder batch as recited in Claim 8, wherein said particles further comprise a dopant selected from the group consisting of Au, Al, Cu and combinations thereof.

10. A powder batch as recited in Claim 8, wherein said particles further comprise a dopant selected from the group consisting of Ag, Cl and combinations thereof.

11. A powder batch as recited in Claim 1, wherein said particles comprise SrGa_2S_4 .

12. A powder batch as recited in Claim 11, wherein said particles further comprise a dopant selected from the group consisting of Eu, Ce and combinations thereof.

13. A powder batch as recited in Claim 1, wherein said particles comprise $\text{Y}_5(\text{Ga,Al})_5\text{O}_{12}$.

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33. A powder batch comprising Y_2O_3 phosphor particles, wherein said particles have a weight average particle size of from about $0.1\ \mu\text{m}$ to about $10\ \mu\text{m}$ and have a substantially spherical morphology, wherein at least about 80 weight percent of said particles are not larger than two times said average particle size.

34. A powder batch as recited in Claim 33, wherein said particles have a weight average particle size of from about $0.3\ \mu\text{m}$ to about $5\ \mu\text{m}$.

15 35. A powder batch as recited in Claim 33, wherein at least about 90 weight percent of said particles are not larger than two times said average particle size.

36. A powder batch as recited in Claim 33, wherein said particles comprise Eu as a dopant.

37. A powder batch as recited in Claim 33, wherein said particles comprise from about 4 to about 6 atomic percent Eu as a dopant.

15 38. A powder batch as recited in Claim 33, wherein said phosphor particles comprise crystallites having an average crystallite size of at least about 25 nanometers.

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54. A powder batch comprising Y₂SiO₅ phosphor particles, wherein said particles have an average size of from about 0.1 μ m to about 10 μ m and wherein said particles have a substantially spherical morphology, wherein at least about 80 weight percent of said particles are not larger than two times said average particle size.

55. A powder batch as recited in Claim 54, wherein said particles have a weight average particle size of from about 0.3 μ m to about 5 μ m.

56. A powder batch as recited in Claim 54, wherein at least about 90 weight percent of said particles are not larger than two times said average particle size.

57. A powder batch as recited in Claim 54, wherein said particles comprise a dopant selected from the group consisting of Tb and Ce.

58. A powder batch as recited in Claim 54, wherein said phosphor particles comprise crystallites having an average crystallite size of at least about 25 nanometers.

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152. A method as recited in Claim 143, wherein no more than about 0.1 weight percent of said phosphor particles are in the form of hard agglomerates.

153. A method as recited in Claim 143, wherein said phosphor particles have an average particle size of not greater than about 5 μm and wherein said
5 particles have not been milled.

154. A method as recited in Claim 143, further comprising the step of adding water to said liquid during processing to maintain the precursor concentration below a predetermined value.